Supporting Data

Bio-process Inspired Synthesis of Vaterite ($CaCO_3$), Directed by a Rationally Designed Multifunctional Protein, ChiCaSifi

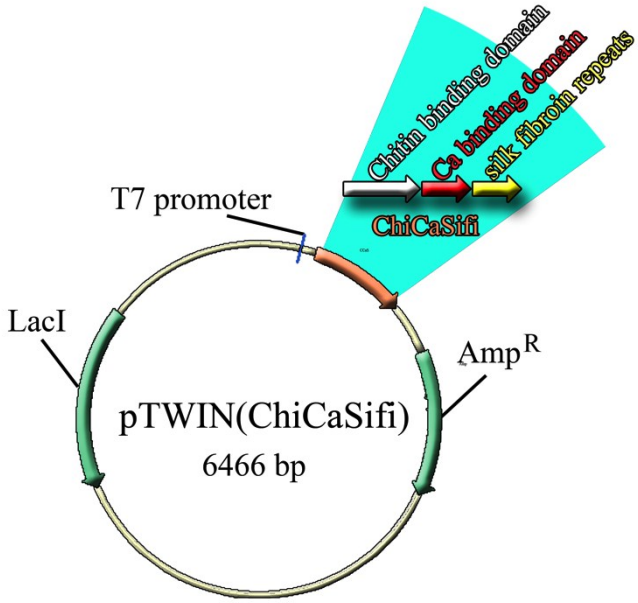

Fig. S1 The map of plasmid pTWIN(ChiCaSifi).

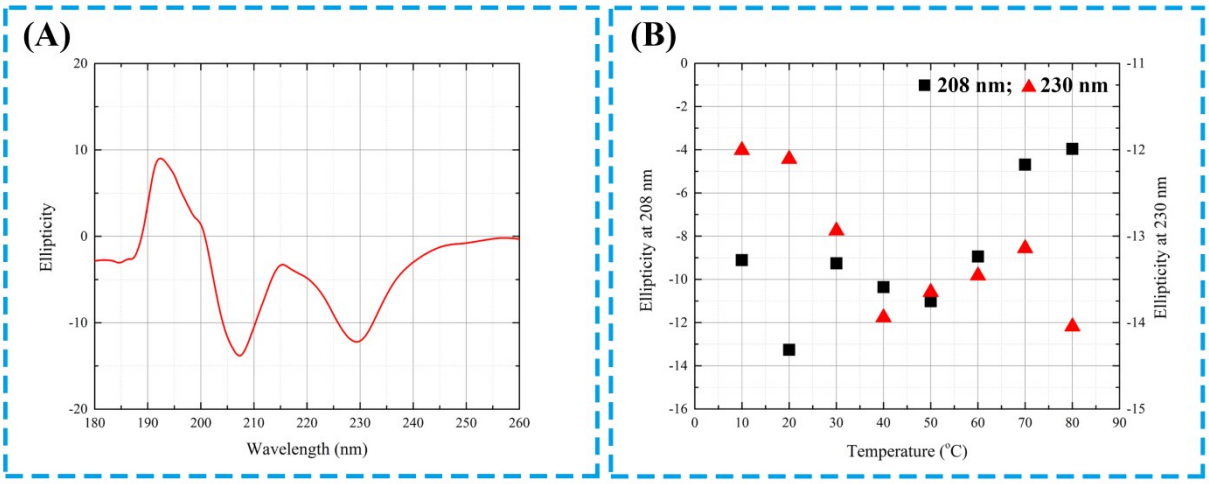

Fig. S2 Circular dichroism (CD) spectrum of ChiCaSifi (Panel A) and thermal unfolding of purified ChiCaSifi (Panel B). In Panel (A), the positive band at 192 nm and negative band at 208 nm are indicative of alpha helical structures (Sreerama and Woody, Methods Enzymol. 2004, 383, 318-51). The negative band at 230 nm is related to beta type structures (Rudra *et al*., PNAS, 2010, 107, 622-627; Hauser *et al.*, PNAS, 2011, 108, 1361-1366; Kornmueller *et al.*, Nano Research, 2014, DOI

10.1007/s12274-014-0683-9). Changes in ellipticity at 208 nm (black box) and 230 nm (red triangle) are shown in Panel (B). It shows that the changes of alpha helical structure start at 50 ^{o}C, while beta type structures start changing at 20 ^{o}C.

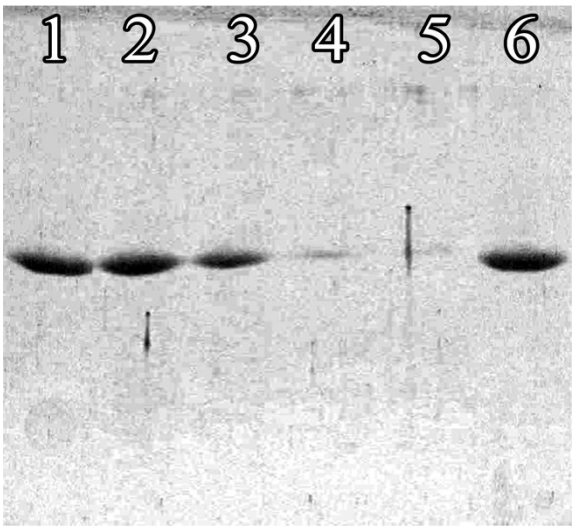

Fig. S3 Purified ChiCaSifi remains binding activity to chitin resin. Protein samples were subjected to Coomassie blue stained SDS PAGE analysis. Purified ChiCaSifi (Lane 1) was dialyzed to remove impurities. After dialysis (Lane 2), ChiCaSifi still bound to chitin (Lane 3) and unbound materials were washed away (Lane 4). The ChiCaSifi bound to chitin were not washed by $CaCl_2$ (Lane 5). Lane 6 is the control which shows the ChiCaSifi loaded on chitin resin before elution.